

When do you call a line straight?¹

Look to your experiences. It might help to think about how you would explain straightness to a 5-year-old (or how the 5-year-old might explain it to you!). If you use a “ruler,” how do you know if the ruler is straight? How can you check it? What properties do straight lines have that distinguish them from non-straight lines?

Think about the question in four related ways:

1. How can you check in a practical way if something is straight—without assuming that you have a ruler, for then we will ask, “How can you check that the ruler is straight?”
2. How do you construct something straight—lay out fence posts in a straight line, or draw a straight line?
3. What symmetries does a straight line have? A symmetry of a geometric figure is a reflection, rotation, translation, or composition of them which preserves the figure. For examples the letter “T” has reflection symmetry about a vertical line through its middle, and the letter “Z” has rotation symmetry if you rotate it half a revolution about its center.
4. Can you write a definition of “straight line”?

¹ This is directly from your book, page 13.

Assignment for next class (Tuesday, January 22):

- Read Chapter 1 of the text

- **Homework assignment 1** first draft due – answer the question “When do you call a line straight?”

- Read for discussion:
 - Read the description of the Van Hiele model for geometric thought at http://images.rbs.org/cognitive/van_hiele.shtml
 - Also, read “The Van Hiele Theory” and “The Levels of Geometric Reasoning” articles (handouts).
 - Reflect on the Van Hiele model. Does it agree with your experience (give examples from your own work with students)? Does it seem innately different than the levels of learning that occur in other areas of mathematics? What level do you think you are at? How could you find out?